graphs (baseline, year 1), selected from patients enrolled in a randomised controlled trial, using Kallman and Kellgren-Lawrence (KL) scoring systems. Patients characteristics were described and baseline and year 1 level of symptoms assessed using a VAS for pain rating and the Functional Index for Hand OA (FIHOA). *Statistics:* The Pearson correlation coefficient was calculated for cross-sectional correlations, between pain and FIHOA scores and radiographic severity assessed using Kallman and KL radiographic scoring methods. For longitudinal correlations, the Pearson correlation coefficient was also used for comparisons between baseline radiographic severity and the clinical evolution, and between baseline levels of pain and dysfunction and radiographic progression over 1 year.

Results: Patients were aged 61 ± 6 years, 93% women, 83% right-handed. The most painful joint at enrollment was the TMC (43%), the PIP (23%) and DIP (31%). Pain rated 56 ± 16 mm and FIHOA score 12 ± 4.6 on average. *Cross-sectional correlations:* There was a correlation between the FIHOA score and radiographic severity assessed by both Kallman (R= 0.34; p= 0.0004)) or KL (R= 0.35; p= 0.0002) scorings. There was also a correlation between pain on a VAS and Kallman scoring (R ranged from 0.19 to 0.21 according to the reader; p= 0.05 and 0.03 respectively), but not with KL scores. Baseline values of pain and FIHOA scores were correlated (R = 0.3; P = 0.0012). *Longitudinal correlations:* No significant correlations were found between baseline radiographic severity and the subsequent course of symptoms, indicating that pain and function were 2 independent variables from baseline radiographic severity. Similarly, no correlation was observed between baseline levels of symptoms (either pain or function) and subsequent radiographic progression over one year.

Conclusions: In this sample the level of HOA symptoms was cross-sectionally correlated to radiographic severity at baseline. But we found no correlation between baseline clinical status and radiographic progression or between baseline radiographic severity and the clinical course of symptoms indicating that radiographic progression and clinical evolution might be independent variables in HOA.

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NATURAL HISTORY OF RADIOGRAPHIC KNEE OSTEOARTHRITIS OVER 3-10 YEARS AFTER PREVIOUS MENISCAL SURGERY

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Purpose: The incidence and progression of knee OA over longer time periods is not well documented. We evaluated change in radiographic knee status over 3-10 years in patients who had been treated by meniscectomy some 25 years earlier.

Methods: We assessed 218 subjects with no associated cruciate ligament tear or radiographic knee OA at time of index meniscectomy. 1st assessment was 16 - 21 y post-surgery, 2nd assessment at 19 - 32 y (mean age att 2nd assessment 59 ± 11 y, women 20%, BMI 27 ± 4). Follow up rate (1st to 2nd assessment) was 73%. Standardized weight-bearing semi-flexed tibiofemoral x-rays from both assessments were graded according to the OARSI atlas. Two investigators, blinded to clinical data, each read all x-rays paired, with knowledge of sequence. Interobserver kappa for detection of healthy, incident, stationary, progressive, and end stage OA cases was 0.65. We defined *incident OA* as new radiographic OA at 2nd assessment, *progressive OA* as an increase in joint space narrowing (JSN) by ≥1 grades in a compartment with previous OA, *end stage OA* as JSN grade 3 at 1st assessment. We excluded subjects with knee arthroplasty (TKR, n = 8) since we were unable to assess radiographic change. We defined radiographic OA as the presence of any of the following in a knee compartment: JSN grade ≥2, sum of the two osteophyte grades ≥2, or grade 1 JSN *AND* a grade 1 osteophyte.

Results: Of 114 knees with *no* radiographic OA at 1st assessment, incident OA was present in 39% at 2nd assessment, resulting in 68% overall prevalence of OA 19-32 y after meniscectomy (72% incl subjects with TKR for OA). Of subjects who already had knee OA at 1st assessment, 69% exhibited radiographic progression (Figure 1).

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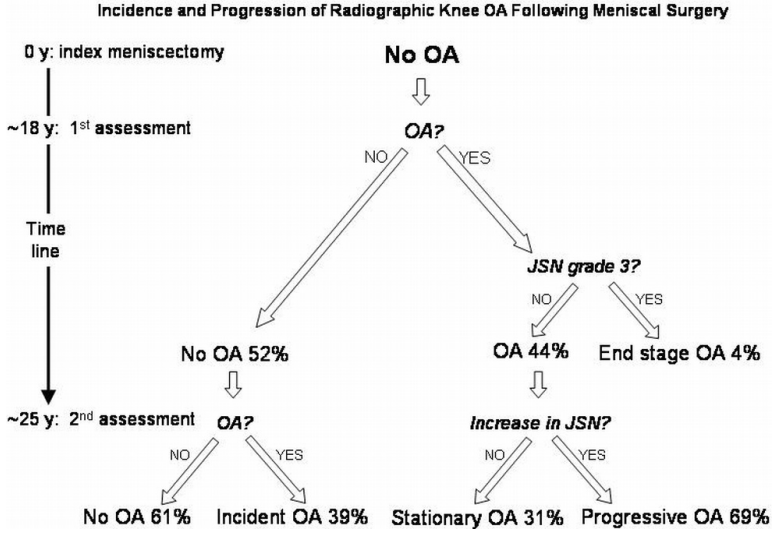

Fig. 1

P329 – Subject characteristics

Subject characteristics at 2nd assessment	No OA at 1st assessment			OA (not endstage) at 1st assessment		
	No OA (n=70)	Incident OA (n=44)	P	Stationary OA (n=29)	Progressive OA (n=66)	P
Age, mean ± SD y	58.2 ± 11.2	57.5 ± 9.8	0.57	57.9 ± 9.6	61.7 ± 10.4	0.10
Sex, no. (%) women	9 (13)	16 (36)	0.005	5 (17)	10 (15)	0.77
BMI, mean ± SD (kg/m2)	26.7 ± 3.2	27.2 ± 4.1	0.39	26.2 ± 4.0	28.1 ± 4.7	0.036
Time between assessments, mean ± SD y	6.2 ± 2.8	7.6 ± 2.8	0.016	5.4 ± 2.4	8.1 ± 2.6	0.0001
Time since meniscectomy, mean ± SD y	23.4 ± 4.5	25.8 ± 4.8	0.013	22.0 ± 3.9	26.6 ± 4.7	<0.0001

Incident OA was more common in women and in those with longer inter-assessment time or longer time since initial meniscectomy. Subjects with progressive OA had significantly higher BMI, longer inter-assessment time, and longer time since initial meniscectomy than non-progressors (Table 1).

Conclusions: A previous meniscectomy is associated with a very high risk of both prevalent and incident radiographic knee OA. In the 3-10 year time window studied here, some 18-32 years after the index meniscal surgery, there is a substantial number of both incident and progressive knee OA cases. These large numbers highlight the important role of meniscal integrity in OA development. They also warrant increased efforts towards better prevention and treatment of meniscal lesions in both the normal knee and the knee with incipient OA. Persons with previous meniscectomy may represent a useful model for studies on OA development and treatment.

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SYSTEMIC EXPOSURE TO INORGANIC SULFATES AFTER ORAL ADMINISTRATION OF GLUCOSAMINE AS HYDROCHLORIDE ALONE OR IN COMBINATION WITH CHONDROITIN SULFATE OR AS CRYSTALLINE GLUCOSAMINE SULFATE IN MAN

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Purpose: The effects of glucosamine on knee osteoarthritis symptoms were revisited by two recent randomised, controlled trials: the GUIDE study confirmed the efficacy of prescription glucosamine sulfate 1500 mg once-a-day, but the NIH-sponsored GAIT failed to show any benefit of nutraceutical glucosamine hydrochloride 500 mg t.i.d. These results may depend on glucosamine peak plasma levels that are much lower with the GAIT formulation (Arthritis Rheum 2005, 9 Suppl:1342 and ACR meeting 2005: Late breaking abstract L13). However, it has been suggested that sulfates may also contribute to the effects of glucosamine. Actually, the combination of glucosamine hydrochloride and chondroitin sulfate was effective in an exploratory analysis of GAIT in the subgroup of patients with moderate-to-severe pain. Therefore, the aim of this preliminary study was to assess the systemic exposure to sulfates after administration of glucosamine sulfate or glucosamine hydrochloride alone or in combination with chondroitin sulfate, by determining the urinary excretion of inorganic sulfates.

Methods: Four healthy volunteers (2 males, 2 females) received for 5 consecutive days either crystalline glucosamine sulfate 1500 mg once-a-day, or the combination of glucosamine hydrochloride 500 mg and chondroitin sulfate 400 mg t.i.d. in a randomised cross-over fashion. In a parallel study arm, four volunteers (2 males, 2 females) were administered only glucosamine hydrochloride 500 mg t.i.d. The urinary excretion of inorganic sulfate was determined over 24 hours at baseline and during the last day of administration by ion exchange chromatography, with a limit of quantitation of 0.01 mM.

Results: The mean (SD) baseline urinary excretion of sulfate in the cross-over study was 12.9±4.5 mM/24 h. After both glucosamine sulfate and the combination of glucosamine hydrochloride with chondroitin sulfate, the urinary excretion of sulfate was higher in all subjects and averaged 17.9±5.2 mM/24 h and 18.4±3.8 mM/24 h, respectively. The mean increase was 5.0±1.8 mM/24 h and 5.6±2.5 mM/24 h, respectively, i.e. similar between groups and corresponding to 40-50% over baseline levels. As expected, glucosamine hydrochloride induced no or negligible changes in sulfate excretion, reflecting only physiological fluctuations and averaging 2.0±2.2 mM/24 h, or 13% over baseline.

Conclusions: Glucosamine hydrochloride provides no systemic exposure to inorganic sulfate. Conversely, the combination of glucosamine hydrochloride with chondroitin sulfate and the standard glucosamine sulfate formulation produce similar exposure to inorganic sulfates, thus possibly explaining some of the contradictory findings within GAIT and in comparison with GUIDE.

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THE EFFECT OF PROGRESSIVE RESISTANCE TRAINING ON CARTILAGE MORPHOLOGY IN WOMEN WITH KNEE OSTEOARTHRITIS

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Purpose: Osteoarthritis (OA) is one of the most common musculo-skeletal disorders, affecting 9.6% of men and 18.0% of women ≥ 60 years of age worldwide. The aim of the study is to investigate the effect of high intensity progressive resistance training (PRT) on articular cartilage morphology in women with knee OA. As the study is ongoing, the aim of this abstract is to present preliminary data on the primary outcome, cartilage thickness.

Methods: Our cohort consisted of women over 40 years of age with knee OA, according to the American College of Rheumatology criteria.

Primary outcome was blinded measurement of cartilage morphology via a 3 Tesla MRI of the tibiofemoral joint (repetition time = 34ms, echo time = 9ms, acquisition time = 10min, flip angle = 25°, slice thickness = 1.4mm, in-plane resolution = 0.312mm). Medial (MT) and lateral tibial (LT) articular cartilage was segmented using Chondrometrics software (CV = 2.2% MT, 2.1% LT). The primary outcome was cartilage thickness. Secondary outcomes included cartilage volume, proportion denuded area, muscle strength, BMI, and WOMAC score.

Subjects were randomised into a PRT or sham-exercise group. Both groups trained 3/week for 6 months. The PRT group trained at 80% of their peak strength, using Keiser pneumatic resistance machines, and were prescribed 3% increments in load per session. Exercises included knee extension and flexion, leg press, plantarflexion, hip abduction and adduction. Sham group trained on the same equipment except hip adduction, but without added resistance or progression.

An intention-to-treat analysis was used. T-test or Wilcoxon signed rank non-parametric test was used for comparing groups at baseline, and Kruskal-Wallis test and ANCOVA adjusted for relevant covariates were used to assess changes over time. Data expressed as mean±SD.

P331 – Table 1. Tibial Cartilage Thickness and Muscle Strength Following a 6 Month Exercise Intervention

Group	Cartilage Thickness (mm)				Change in Overall Muscle Strength (%)
	Medial Tibia (n=14)		Lateral Tibia (n=17)		
	Pre	Post	Pre	Post	
PRT	1.41 ± 0.26	1.36 ± 0.23	1.72 ± 0.30	1.72 ± 0.24	52±27*
Sham	1.25 ± 0.20	1.26 ± 0.19	1.68 ± 0.37	1.71 ± 0.35	6±16*

* P = 0.001 between group difference in change score